

Appendix B

Best Management Practices and Conditions of Approval



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1.0 Introduction

Best management practices (BMPs) are land and resource management techniques designed to maximize beneficial results and minimize negative impacts of management actions. Best management practices are applied as Conditions of Approval (COA) or may be selected by an applicant and incorporated into their request of authorization approvals. Best management practices are defined as methods, measures, or practices selected on the basis of site-specific conditions to provide the most effective, environmentally sound, and economically feasible means of managing an activity and mitigating its impacts. Interdisciplinary site-specific analysis is necessary to determine which management practices would be necessary to meet specific goals. Selection and implementation of any BMPs will be evaluated against the Colorado Public Land Health Standards (BLM, 1997b) to ensure progress toward public land health attainment. Best management practices include, but are not limited to, structural and nonstructural controls, operations, and maintenance procedures. Best management practices can be applied before, during, and after pollution-producing or surface-disturbing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 Code of Federal Regulation 130.2(m), U.S. Environmental Protection Agency [EPA] Water Quality Standards Regulation) or to prevent unnecessary or undue degradation of resources.

Best Management Practices are identified as part of the National Environmental Policy Act (NEPA) process, with interdisciplinary involvement. Because the control of nonpoint sources of pollution and prevention of damage to other resources is an ongoing process, continual refinement of BMP design is necessary. This process can be described in five steps, which are: (1) selection of design of a specific BMP; (2) application of BMP; (3) monitoring; (4) evaluation; and (5) feedback. Data gathered through monitoring is evaluated and used to identify changes needed in BMP design, application, or in the monitoring program.

Best Management Practices described in this appendix are a compilation of existing policies and guidelines and commonly employed practices designed to assist in achieving the objectives for maintaining or minimizing water quality degradation from nonpoint sources; preventing the loss of soil productivity; providing guidelines for aesthetic conditions within watersheds; and mitigating impacts to soil, vegetation, or wildlife habitat from surface-disturbing activities. Best management practices are selected and implemented as necessary, based on site-specific conditions, to meet a variety of resource objectives for specific management actions. Therefore, this document does not provide an exhaustive list of BMPs, as additional BMPs or modifications may be identified to minimize the potential for negative impacts when evaluating site-specific management actions through an interdisciplinary process.

In addition, implementation and effectiveness of BMPs need to be monitored to determine whether the practices are achieving resource objectives and accomplishing desired goals. Adjustments will be made as necessary.

Each of the following BMPs are a part of the coordinated development of the White River Field Office (WRFO) Draft Resource Management Plan Amendment and Environmental Impact Statement (Draft RMPA/EIS) for Oil and Gas Development, and may be updated as new information becomes available to ensure objectives are met and to conform with changes in Bureau of Land Management (BLM) regulations, policy, direction, or new scientific information. Applicants also may suggest alternative procedures that could accomplish the same result. These guidelines will apply, where appropriate, to all use authorizations, including BLM-initiated projects. Any BMP listed may be used in any program wherever it may be effective.

Planning criteria were established to provide focus for data collection efforts, achieve compliance with legal mandates, and facilitate decision making. General and specific criteria that pertain to the RMPA/EIS are described in Chapter 1 of the Draft RMPA/EIS.

2.0 Best Management Practices and/or Conditions of Approval

2.1 Air Resources

The operator/holder will limit unnecessary emissions from point or nonpoint pollution sources and prevent air quality deterioration from necessary pollution sources in accordance with all applicable Federal, State, and local air quality laws and regulations.

The operator/holder will limit air pollutant emissions in accordance with management actions established in Chapter two and Appendix J of this RMP.

All access roads and the pipeline ROW will be treated with water and/or a BLM-approved chemical dust suppressant during construction and drilling activities so that there is not a visible dust plume behind vehicles. All vehicles will abide by company or public speed restrictions during all activities. If water is used as a dust suppressant, there should be no traces of oil or solvents in the water and it should be properly permitted for this use by the State of Colorado. Only water needed for abating dust should be applied; dust abatement should not be used as a water disposal option under any circumstances.

In the Mesaverde Play Area, proper road design, construction, and surfacing on resource roads (see BLM Manual Section 9113) would be required to achieve at least 80 percent reduction from uncontrolled fugitive dust emissions (using a combination of chemical suppression, watering, or other control measures). Resource roads in planning units other than the Mesaverde Play Area would be required to achieve at least 50 percent fugitive dust control effectiveness.

2.2 Coal Resources

All drill holes must be plugged with cement through the underground minable coal beds and aquifers for a distance of at least 50 feet above and below the coal beds and aquifers.

Holes may be plugged with a mud conditioner subject to the following: a. Drill holes encountering aquifers having artesian flow shall be plugged from bottom to top with a neat cement slurry or, at a minimum, be cemented across to a minimum of 50 feet on either side of the aquifer. b. Other drill holes not plugged with cement shall be plugged with abandonment mud having 10-second API gel strength of at least 20 pounds per 100 square feet and a filtrate volume not to exceed 13.5 cc, as determined by accepted procedures. The abandonment mud mix shall have a Marsh Funnel viscosity of at least 20 seconds per quart greater than that of the drilling fluid or at least 55 seconds Marsh Funnel viscosity.

All drill holes shall be plugged as soon after drilling as possible and at the surface with a minimum of five feet of cement.

Any hole proposed for groundwater monitoring must be completed and cemented to isolate all aquifer intervals that show significant head differences or changes in water quality to prevent mixing of unlike waters. Mineable coal beds also must be isolated using casing and cement.

All drilling fluid, foam, cuttings, and water must be contained on the drill site. Portable pits may be used; however, earth pits will be required if large volumes of fluid are encountered. Pits will be pumped out or allowed to dry completely before backfilling. Drill cuttings not returned to the hole shall be buried, hauled away, or scattered in a thin layer so they do not inhibit plant growth.

2.3 Heritage Resources

The operator/holder/applicant is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.

If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator/holder/applicant will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator/holder/applicant, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.

Pursuant to 43 CFR 10.4(g), the operator/holder/permittee/applicant must notify the Authorized Officer (AO), by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), the operator/holder/permittee/applicant must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.

Mineral material sales (e.g., sand and gravel) would not be allowed within the Canyon Pintado National Historic District (NHD).

Any new surface disturbance within the Canyon Pintado NHD would be required to be monitored by an approved and qualified archaeologist under the following conditions: Activity occurs in the vicinity of known resources. Activity occurs in the alluvial bottoms along Douglas Creek and its tributaries. Activity occurs in deep alluvial soils.

If any paleontological resources are discovered as a result of operations under this authorization, the operator/holder or any of his agents must stop work immediately at that site, immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinators instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinators instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

The operator/holder/ is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate fossils, collecting large amounts of petrified wood (over 25lbs./day, up to 250lbs./year), or collecting fossils for commercial purposes on public lands.

Any excavations into the underlying native sedimentary rock must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.

2.4 Geophysical

In general, the BLM requires an examination of resource values and development of appropriate surface protection and reclamation measures before the geophysical contractor begins surface-disturbing activities associated with preliminary investigations. BLM will solicit involvement from public land users (e.g., grazing permittees) to develop site-specific protection measures and reclamation specifications. Compliance monitoring should occur during and after seismic exploration activities when or if necessary. Compliance inspections during the operation would ensure that requirements and guidelines are being followed. Compliance inspections upon completion of work would ensure that the lines are clean and drill holes are plugged properly.

Blasting or vibrating within 1/8-mile of federally-owned or controlled springs and flowing water wells would not be allowed.

Plugging of drill shot holes will conform to the Colorado Reclamation Standards Abandoned Drill Holes Act. Drill hole cuttings shall be placed back in the hole.

No blading or other dirt work will be allowed without specific written permission from the Area Manager.

2.5 Oil and Gas

General

In conformance with Onshore Oil and Gas Order No. 1, operators would prepare and submit individual comprehensive drill site design plans for BLM approval. These plans would show the drill location layout over the existing topography, dimension of the location, volumes and cross-sections of cut and fill, location and dimensions of reserve pits, existing drainage patterns, and access road egress and ingress. Plans would be submitted and approved prior to initiation of construction.

Activities occurring during preliminary investigations may include remote sensing; mapping of rock outcrops and seeps (either of which result in little or no surface disturbance); and seismic, gravity, and magnetic surveys.

Operators would contact the BLM AO's field representative no earlier than 15 days and no later than 3 working days prior to commencement of construction activities. Construction under adverse conditions may require additional mitigation measures.

If applicable, the operator shall plan all activities and operations in a manner so as to avoid infringing on any timing limitations, without the need to apply for exceptions to the specified timing limitations.

In order to monitor activity, reclamation, and potential impacts to wildlife, the BLM WRFO requires notification of the following activities to the designated Natural Resource Specialist/Realty Specialist:

Activity	Timeframe	Method
Construction ⁽¹⁾	24 hours	Sundry Notice and either Email or Phone
Reclamation ⁽²⁾	Prior to start	
Drilling Rig Moves on Location	Within 24	Sundry Notice
Well Spud ⁽³⁾	Hours after Start	
Drilling Rig Leaves Location	Within 24	Sundry Notice
Completion Rig Moves on Location	Hours after start	
Completion Rig Leaves Location	Within 24	Sundry Notice
Work-Over Rig Moves on Location	Hours after start	
Work-Over Rig Leaves Location	Hours after start	Sundry Notice

NOTES:

- ⁽¹⁾ Construction-related activities may include, but are not limited to, pad and road construction, pad expansion, clearing pipeline corridors, trenching, recontouring. The Sundry Notice will include the well pad name, location, and date of construction.
- ⁽²⁾ Reclamation activities may include, but are not limited to, seed bed preparation that requires disturbance of surface soils, seeding, or constructing exclosures (e.g., fences) to exclude livestock from reclaimed areas.
- ⁽³⁾ Breaking ground for drilling surface casing.

Post-Construction GIS Data Submission:

In order to track reclamation of actions related to the development of Federal mineral resources, the operator shall provide the designated (Natural Resource Specialist [NRS] or Realty Specialist) with geospatial data in a format compatible with the WRFOs geographic information system (GIS) (i.e., point or polygon features). These data will be used to accurately locate and identify all geographic as-built (i.e., constructed and design implemented) features associated with this project.

- These data shall be submitted within 60 days of construction completion. If the operator is unable to submit the required information within the specified time period, the operator shall notify the designated [NRS or Realty Specialist] via email or phone, and provide justification supporting an extension of the required data submission time period.
- GIS polygon features may include, but are not limited to: full well pad footprints (including all stormwater and design features), constructed access roads/widths, existing roads that were upgraded/widths, temporary use areas, and pipeline corridors.
- Acceptable data formats are: (1) corrected global positioning system (GPS) files with sub-meter accuracy or better; (2) ESRI shapefiles or geodatabases; or (3) AutoCAD .dwg or .dxf files. If possible, both (2) and (3) should be submitted for each as-built feature. Geospatial data must be submitted in UTM Zone 13N, NAD 83, in units of meters. Data may be submitted as: (1) an email attachment or (2) on a standard compact disk (CD) in compressed (WinZip only) or uncompressed format. All data shall include metadata, for each submitted layer, that conforms to the Content Standards for Digital Geospatial Metadata from the Federal Geographic Data Committee standards. Questions shall be directed to WRFO BLM GIS staff at (970) 878-3800. If the operator is unable to send the data electronically, the operator shall submit the data on compact disk(s) to the designated [NRS or Realty Specialist].
- Internal and external review of the reporting process and the adequacy of the associated information to meet established goals will be conducted on an on-going basis. New information or changes in the reporting process will be incorporated into the request, as

appropriate. Subsequent permit application processing may be dependent upon successful execution of this request, as stated above.

Special location, design and reclamation measures may be required to protect scenic and natural landscape values and achieve the minimum adverse impact on visual quality. These design measures may include a variety of landscaping treatments and construction guidelines intended to minimize visual contrasts with surrounding landscapes. Surface disturbing activities may be moved up to 600 feet to avoid sensitive areas or to reduce the visual effects of the proposal. These measures would be applied to the following VRM Class II and Class III areas: (1) Canyon Pintado National Historic District; (2) State Highways 13, 40, 64 and 139 corridors; (3) Viewsheds in the Blue Mountain/Moosehead GRA; (4) White River Corridor; (5) Douglas and Baxter Pass divide; (6) Cathedral Bluffs; and (7) VRM Class II areas around Meeker. These measures may also be applied to other areas on a case by case basis.

Reserve Pits, and Pits other Than Reserve Pits, and Drilling Muds

Prior to the onset of drilling, a “stock tight” fence would be installed on three sides of the reserve pit. This fence would be woven wire at least 28 inches high and within 4 inches of ground surface, with two strands of barbed wire above the woven wire with 10-inch spacing. The fence corners would be double H-brace panels constructed with treated wood corner posts or steel pipe posts of at least 4-inch outside diameter (see Gold Book, pgs. 16-18). The corner brace posts would securely set a minimum of 30 inches in the ground. Metal T-posts are not allowed for corner panel construction, but they may be used between corner panels. The fourth side of the reserve pit would be fenced after the drilling rig moves off the location. The fence would be located a maximum of 5 feet from the edge of the reserve pit. The double H-braces would be used on all corners of the pit area. The operator would implement measures to prevent wildlife and livestock from entering the reserve area during drilling and well completion operations before the fourth side of the fence has been constructed.

All reserve pits will be lined with a synthetic liner with a minimum thickness of 24 mils and shall be of a high-density polyethylene, polypropylene, poly vinyl chloride, hypalon, or other synthetic material that is impervious, weather resistant, and resistant to deterioration when in contact with hydrocarbons, aqueous acids, alkali, fungi, or other substances in the produced water. The synthetic liners shall also be resistant to deterioration by ultraviolet light, punctures and tearing, and shall be designed for the life of the pit.

The reserve pit will be allowed to dry through natural evaporation for up to six months after the drill rig has left the location. If a pit has not dried by the end of this period, all remaining fluids and/or mud must be removed and disposed of in an approved manner. The concentration of hazardous substances in the reserve pit at the time of pit backfilling must not exceed the standards set forth in CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980).

Before conducting any reserve pit evaporation, by means other than natural evaporation, the operator would submit a Sundry Notice for Authorized Officer approval. The Sundry Notice would provide a detailed description of the drying method. The operator is required to obtain authorization from the COGCC for pit fluid treatment by means other than natural evaporation.

Slope, grade, and other construction control stakes (e.g., exterior boundary centerline) would be placed, as necessary, to ensure construction in accordance with the surface use plan. The cut and fill slopes and spoil storage areas would be marked with a stake and/or lath at a minimum of 50-foot intervals. The tops of the stakes or laths would be painted or flagged in a distinctive color. All

boundary stakes and/or laths would be maintained in place until final construction cleanup is completed. If stakes are disturbed, they would be replaced before proceeding with construction.

It is the operator's responsibility to design and construct a liner system to contain fluids in the pits that contain liquids without compromising the integrity of the liners. Liners must be installed over smooth fill subgrade that is free of pockets, loose rocks, or other materials that could damage the liner. The pit should be padded with material if necessary to reduce potential damage to the liner by sharp rock edges. Sand, sifted soil or bentonite are suggested.

Reserve pits, evaporation ponds, or other oil and gas related pits shall be designed and operated in a manner that deters or prevents access to birds, waterfowl, livestock and wildlife. Pit netting is an example of a measure to accomplish this requirement.

Pits shall not be constructed on known intermittent or perennial springs, seeps, or other near surface water features. If groundwater is encountered during pit construction activity, pit construction shall cease and the location shall be reclaimed. An alternate location or an alternate plan (e.g., disposing of pit contents offsite or use of a closed loop and/or semi-closed loop system) must be submitted via Sundry Notice and approved by the AO before resuming operations. Pits shall be constructed, monitored, and operated to provide for a minimum of two feet of freeboard at all times and maintain fluids in pits at the lowest practicable level, subject to the type of operation in process.

All produced liquids shall be contained in a pit or tank, including the dehydrator vent/condensate line effluent. All production pits shall have a livestock-proof fence. All pits shall be bermed. Pits designed to contain fluids shall be constructed so that leaking or breaching problems are minimized and reclamation potential is maximized. At least 50percent of the pit capacity shall be in cut material. Since all pits may receive fluids from completion and fracing activities and soluble materials left in pits may migrate into the shallow groundwater, all pits (including cuttings pits) shall be lined with 24 mil reinforced liner and closed as per Onshore Order, Gold Book, and COGCC requirements. Pits may be allowed to air dry, but the use of chemicals to aid in fluid evaporation, stabilization, or solidification must have prior BLM approval.

If the COGCC requires the removal of the pit liner, the method of removal and location of disposal for pit liners and pit solids must be submitted to the AO and approved before beginning the pit closure. If pit liners are to be left in place, the fluids from the pit must be removed and/or evaporated before closing. The pit liner should be cut or folded at the mudline and the pit should be buried with at least 3 feet from final grade before interim reclamation efforts are started.

Pits remaining after the drilling period which store or are expected to store production fluids will be wired or netted to prevent or discourage entry by larger birds attracted to sources of water, including raptors and waterfowl. At a minimum, wire will be stretched over the entire length and breadth of the pit at intervals not exceeding three feet, and made permanently conspicuous either by choice of material or installation of flagging material evenly distributed across the pit at a minimum rate of one flag per 18 square feet.

Operators would submit a Sundry Notice describing how the oil contaminated drill cuttings would be treated to assure the oil stays contained in the cuttings and where the cuttings would be ultimately be stored (i.e., buried in the flare pit, buried in a separate "on-location" pit, or removed to a state-approved disposal site. Any on location disposal sites for the oil contaminated drill cuttings would be lined with a 12-mil or stronger impervious liner compatible with oils. A liner meeting this

specification also would be placed under any temporary storage area for the oil contaminated cuttings.

The operator shall exercise extreme caution to avoid discharging oil-based drilling mud into the reserve pit. Should an event occur, all oil from the surface of reserve pit will be removed within 24 hours.

Any drilling fluids pit that shows indications of containing hazardous wastes would be tested for the Toxicity Characteristic Leaching Procedure constituents. If analysis proves positive, the fluids would be disposed of in an approved manner. The cost of the testing and disposal would be borne by the potentially responsible party.

Drilling, well completion, and workover lights would be shrouded and directed on to the drilling platform and/or well pad, to the extent allowed by safety requirements, so that lights/glare are not directed away from the well pad.

Permanent and temporary lighting fixtures on oil and gas facilities should be shrouded and directed to illuminate only the location needed for work or safety. Care should be taken to not distract driving on roads adjacent to facilities, unnecessarily disrupt wildlife with lighting or contribute to light pollution not in keeping with rural and natural environments.

Production Facilities

All storage tank batteries, including drain sumps and sludge holdings at compressor facilities, installed on location and designed to contain any oil, glycol, produced water, or other fluid that may constitute a hazard to public health or safety, would be surrounded by a secondary means of containment for the entire contents of the largest single tank in use plus 1 foot of freeboard for precipitation or 110 percent of the capacity of the largest vessel. The appropriate containment and/or diversionary structures or equipment, including walls and floor, to prevent discharged fluid from reaching ground, surface, or navigable waters, would be impervious to any oil, glycol, produced water, or other fluid for 72 hours and would be constructed so that any discharge from a primary containment system (e.g., tank or pipe) would not drain, infiltrate, or otherwise escape to ground, surface, or navigable waters before cleanup is completed.

Treaters, dehydrators, and other production facilities installed on location that have the potential to leak or spill oil, glycol, produced water, or other fluid that may constitute a hazard to public health or safety, would be placed on or within an appropriate containment and/or diversionary structure to prevent spilled or leaking fluid from reaching ground, surface, or navigable waters. The appropriate containment and/or diversionary structure would be sufficiently impervious to oil, glycol, produced water, or other fluid and would be installed so that any spill or leakage would not drain, infiltrate, or otherwise escape to ground, surface, or navigable waters before cleanup is completed.

All aboveground permanent structures (permanent means onsite for longer than 90 days) not subject to safety requirements would be painted by the operator to blend with the natural color of the landscape. New production facilities would be painted a noncontrasting color that is harmonious with the surrounding landscape as specified and approved by the BLM on a case-specific basis.

The operator/holder assumes responsibility for the integrity of site [insert number] for the duration of the life or operation of [insert project/well pad name/number]. This includes, but is not be limited to, having an approved archaeological consultant conduct yearly monitoring of site [insert number] as well as any stabilization or data recovery necessitated by site degradation, whether resulting from

construction and operation of [insert project/well pad name/number], vandalism, erosion, or any other cause.

Well Plugging Standards

A. Open Hole: Cement plug shall be placed to extend at least from 50 feet below the bottom (except as limited by total depth (TD) or plugged back total depth (PBSD) to 50 feet above the top of (1) any zones encountered during drilling that contain fluid with a potential to migrate; (2) lost circulation zones; and (3) any potential valuable minerals, including noncommercial hydrocarbons, coal, and oil shale. Extremely thick sections may be secured by placing 100-foot plugs across the top and bottom of the formation. Lost circulation zones may require alternate methods. In the absence of productive zones or minerals that otherwise require placement of cement plugs, long sections of open hole shall be plugged at least every 3,000 feet. Such plugs shall be placed across in-gauge sections of the hole.

B. Cased Hole: Cement plug shall be placed opposite all open perforations and extend a minimum of 50 feet below (except as limited by TD or PBSD) to 50 feet above the perforated interval. In lieu of the cement plug, a bridge plug is acceptable, provided: (1) the plug is set as close as practical above the open perforations; (2) the perforations are isolated from any open hole below; and (3) the plug is capped-if cap is placed through tubing, a minimum of 50 feet of fill-up is required; if placed by bailer, a minimum of 35 feet of fill-up is needed. If production casing is cut and recovered, a cement plug shall be placed to extend at least 50 feet above and below the stub. An additional cement plug shall be placed to extend a minimum of 50 feet above and below the shoe of the surface casing (or intermediate string, as appropriate). The exposed hole resulting from the casing removal must be secured as required above.

C. Annular Space: No annular space that extends to the surface shall be left open to the drilled hole below. If this condition exists, a minimum of the top 50 feet of annulus shall be plugged with cement.

D. Testing: The first plug below the surface plug shall generally be tested by either tagging the plug with the working pipe string or pressuring to a minimum pump (surface) pressure of 1,000 psig with no more than a 10 percent drop during a 15-minute period (cased hole only). If the integrity of any other plug is questioned, it must be tested in the same manner. Also, any cement plug that is the only isolating medium for a fresh water interval or a zone containing a valuable mineral deposit should be tested by tagging with the drill string. Tagging the first plug below the surface plug will not be necessary where water flows or valuable mineral deposits have not been encountered.

E. Surface Plug: A cement plug of at least 50 feet shall be placed in the smallest casing that extends to the surface. The top of this plug shall be placed as near the eventual casing cut-off point as possible.

F. Mud: Each interval between the plugs shall be filled with mud of sufficient density to exert hydrostatic pressure exceeding the greatest formation pressure encountered while drilling such interval. In the absence of other information at the time plugging is approved, a minimum mud weight of nine pounds per gallon shall be specified.

G. Surface Cap: All casing shall be cut off at the base of the cellar or three feet below final restored ground level (whichever is deeper). The casing shall be filled from the cement plug to the surface with suitable material (e.g., cement, sand, gravel). The well bore must then be covered with a metal plate at least 1/4-inch thick, welded in place, or a four-inch pipe, extending four feet above

the recontoured ground surface and embedded in cement as specified by the authorized officer. The well location and identity shall be permanently inscribed on the pipe or plate.

Surface Disturbance

Special design and reclamation measures may be required, as appropriate, to protect scenic and natural landscape values. This may include transplanting trees and shrubs, mulching and fertilizing disturbed areas, removing surfacing material, imprinting, irrigating, using low-profile permanent facilities, and painting to minimize visual contrasts. Surface-disturbing activities may be moved to avoid sensitive areas or to reduce the visual effects of the proposal.

Prior to approving surface-disturbing or potentially impacting activities within known or potential habitat for a listed, proposed or candidate plant species, a plant inventory conducted by a qualified botanist and an environmental analysis would be required for the Proposed Action. Based on the results of the plant survey, informal consultation with the FWS may be conducted during preparation of the environmental analysis. Formal consultation with the FWS would occur if the environmental analysis indicates a finding of possible impact to a listed species and the Proposed Action cannot be moved to avoid the impact.

All disturbed areas will be contoured to the original contours or at least to blend with the natural topography. Blending is defined as reducing form, line, shape and color contrast with the disturbing activity. In visually sensitive areas, all disturbed areas shall be contoured to match the original topography. Matching is defined as reproducing the original topography and eliminating form, line, shape and color caused by the disturbance as much as possible. See Appendix D (WRFO Surface Reclamation Plan) of the RMPA/EIS.

Pursuant to 43 CFR 10.4(g), the operator/holder/permittee/applicant must notify the Authorized Officer (AO), by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), the operator/holder/permittee/applicant must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.

All construction activity shall cease when soils or road surfaces become saturated to a depth of three inches unless there are safety concerns or activities are otherwise approved by the AO.

Topsoil will be removed to a depth of 6-8 inches or as determined on-site by BLM in areas of surface disturbance. To protect topsoil for future use during reclamation, topsoil piles will be covered, seeded, labeled, and stored unmixed with other soils.

Any erosion features (e.g., rilling, gully, piping, or mass wasting) located either on or adjacent to the surface disturbance will be addressed immediately after observation by contacting the Natural Resource Specialist/Realty Specialist and by submitting a plan to assure successful soil stabilization with BMPs to address erosion problems.

All areas where the topsoil has been removed and soils have become compacted will be ripped to a depth of 18 inches below the finished grade or to bedrock, whichever is less. Another suitable method of de-compaction may be used before topsoil is re-spread with approval of the BLM AO. Areas where the topsoil has not been removed, but have been compacted, must be de-compacted by disking or other methods to prepare the soils for reclamation.

Road Design and Maintenance

General

General access to the following locations shall be restricted by means of a lockable gate (may require fence wings) placed along the proposed access at a point as close as possible to the intersection of the proposed and established access: [List locations]. The operator is responsible for constructing and maintaining these structures through the life of the project. The selected control point is subject to the approval of the AO with the objectives of effectively deterring all unauthorized vehicle use not associated with natural gas development and production (including other BLM permitted users, but excepting CPW District Wildlife Managers and BLM Rangers, [others]) and preventing bypass of the gate. These gates would be installed [selected timeframe] and are to remain closed and locked throughout the year, though they may remain open temporarily during well development or maintenance activities that require high traffic volumes.

Road Design

All road and well pad construction will adhere to Gold Book standards (DOI and USDA 2007) and to BLM Manuals 9112 and 9113 (BLM 1984, 1985), relating to culvert and road design and construction requirements.

Base road design criteria and standards on road management objectives such as the Gold Book, BLM Handbook, traffic requirements of the proposed activity and the overall transportation plan, economic analysis, safety requirements, resource objectives, and minimizing damage to the environment.

Locate roads to minimize heights of cutbanks. Avoid high, steeply sloping cutbanks in highly fractured bedrock.

Bridges and culverts on waters that support aquatic habitat will be designed to maintain the natural stream channel to the greatest extent feasible. Locate roads on well-drained soil types. Minimize their influence on riparian areas and, when stream crossing is necessary, design the approach and crossing perpendicular to the channel. Locate the crossing where the channel is well-defined, unobstructed and straight.

Locate roads on stable positions (e.g., ridges, natural benches, and flatter transitional slopes near ridges and valley bottoms). Implement extra mitigation measures when crossing areas of unstable or fragile soils.

Construct roads for surface drainage by using outslopes, crowns, grade changes, drain dips, waterbars, and/or insloping to ditches as appropriate.

When roads are located in low-lying areas, ensure that the road surface is constructed above the adjacent ground surface.

Sloping the road base to the outside edge for surface drainage and installing water bars is normally recommended for local spurs or minor collector roads where low-volume traffic and lower traffic speeds are anticipated. This is also recommended in situations where long intervals between maintenance will occur and where minimum excavation is wanted. Outsloping is not recommended on gradients greater than eight to 10 percent.

Sloping the road base to the inside edge is an acceptable practice on roads with gradients more than 10 percent and where the underlying soil formation is very rocky and not subject to appreciable erosion or failure. Inside ditch should be drained with cross-drains at regular intervals so that runoff does not accumulate and cause erosion. Cross-drains may include installation of 18 –inch diameter culverts or waterbars depend on the road design.

Crown and ditching is recommended for arterial and collector roads where traffic volume, speed, intensity and user comfort are considerations. Gradients may range from two to 15 percent as long as adequate drainage away from the road surface and ditchlines is maintained.

Locate and design drainage dips immediately upgrade of stream crossings, providing buffers and sediment basins, to prevent sediment from entering surface water features.

Do not locate drainage dips where water might accumulate or where there is an outside berm that prevents drainage from the roadway.

Provide vegetative or artificial stabilization of cut and fill slopes in the design process. Avoid establishment of vegetation where it inhibits drainage from the road surface or where it restricts safety or maintenance.

Avoid sidecasting where it will adversely affect water quality or weakens stabilized slopes.

Provide for erosion-resistant surface drainage prior to fall rain or snow.

Improve flat gradients to a minimum of two percent or provide raised subgrade sections to avoid saturation of the road base.

Identify potential water problems caused by off-site disturbance and add necessary drainage facilities.

Identify ditchline and outlet erosion caused by excessive flows and add necessary drainage facilities and armoring.

Add additional full-rounds, half-rounds, and energy dissipators as needed for drainage ditches.

Correct special drainage problems (e.g., high water table, seeps) that affect stability of subgrade by using perforated drains, geotextiles, or drainage bays.

Eliminate undesirable berms that retard normal surface runoff.

Surface roads needing to be accessed in wet weather for normal operations and surface inadequately surfaced roads that are to be left open to public traffic during wet weather.

Roadside brushing should be done in a way that prevents disturbance to root systems (i.e., avoid using excavators for brushing).

Culverts and Drainage Features

Culverts and waterbars should be installed according to BLM Manual 9113 standards and sized for the 10-year storm event with no static head and to pass a 25-year event without failing.

Keep road inlet and outlet ditches, catch basins, and culverts free of obstructions, particularly before and during spring run-off. Routine machine-cleaning of ditches should be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.

Locate culverts or drainage dips in such a manner as to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing to avoid accumulation of water in ditches or road surfaces. Install culverts with adequate armoring of inlet and outlet. Operator/holder is responsible for maintaining the integrity of road beds as well as erosion control and drainage features.

Proper sized aggregate and rip rap should be used during culvert construction. Place rip rap at culvert entrance to streamline water flow and reduce erosion; provide aggregate for energy dissipations at culvert or drainage dip outlets.

Install cross drains for inside drainage ditches on roads according to the following: Percent Grade; Spacing (feet); 1-6; 300; 7-9; 200; 10-14; 150; 15-20; 90; 21-40; 50; Over 41; 25

Place permanent stream-crossing structures on fishery streams before heavy equipment moves beyond the crossing area. Where this is not feasible, install temporary crossings to minimize stream disturbance.

Use 12 inches as the minimum recommended cover over a culvert, or one-half the diameter of the culvert, whichever is greater.

Compact fill in lifts during culvert installation with water or other soil material in such a way that the loads anticipated will not deteriorate the road base or fill above and around the culvert. Armor fill as described above to protect compacted fill.

Monitor culvert installations to ensure adequate armoring of inlet and outlet and no erosion of design. Patrol areas susceptible to road or watershed damage during periods of high runoff.

Bridges

Bridges and major culverts should be designed and constructed according to the standards provided in BLM Manual 9112. The design, review, and evaluation of these crossings must be accomplished under the direct supervision of a registered professional engineer.

If the installation of a bridge would result in the discharge of soil into water, a permit must be obtained from the U.S. Army Corps of Engineers according to Section 404 of the Clean Water Act of 1977.

Road Maintenance and Abandonment

Locate and maintain roads to prevent their influence on riparian areas and surface waters, when stream crossing is necessary, design the approach and crossing perpendicular to the channel. Locate the crossing where the channel is well-defined, unobstructed and straight.

Perform maintenance to conserve existing surface material; retain the original crowned or outsloped, self-draining cross-section; and prevent or remove rutted berms (except those designed for slope protection) and other irregularities that retard normal surface runoff. Avoid casting loose ditch or surface material past the shoulder where it can cause stream sedimentation or weaken slump-prone areas. Avoid undercutting backslopes.

Promptly remove slide material when it is obstructing road surface and ditchline drainage. Save all soil or material useable for reclamation and stockpile for future reclamation needs. Use remaining slide material for needed road improvement or place in a stable waste area. Avoid sidecasting of slide material where it can damage, overload, saturate embankments, or flow into downslope drainage courses. Reestablish vegetation in areas where more than 50 percent of vegetation has been destroyed due to sidecasting.

Do not disturb the toe of cutslopes while pulling ditches or grading roads. Avoid side casting road material into streams.

Grade roads only as necessary. Maintain drain dips, waterbars, road crown, insloping, and outsloping, as appropriate, during road maintenance.

Maintain roads in special management areas according to special management area guidance. Generally, retain roads within existing disturbed areas and side cast material away from the special management area.

Well access roads following abandonment will be recontoured and reclaimed as consistent with the transportation plan.

2.6 Fire Management

When working on lands administered by the BLM WRFO, notify Craig Interagency Dispatch (970-826-5037) in the event of any fire.

- a. The reporting party will inform the dispatch center of fire location, size, status, smoke color, aspect, fuel type, and provide their contact information.
- b. The reporting party, or a representative of, should remain nearby, in a safe location, in order to make contact with incoming fire resources to expedite actions taken towards an appropriate management response.
- c. The applicant and contractors will not engage in any fire suppression activities outside the approved project area. Accidental ignitions caused by e.g., welding, cutting, grinding, will be suppressed by the applicant only if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If chemical fire extinguishers are used the applicant must notify incoming fire resources on extinguisher type and the location of use.
- d. Natural ignitions caused by lightning will be managed by Federal fire personnel. If a natural ignition occurs within the approved project area, the fire may be initially contained by the applicant only if employee safety is not endangered. The use of heavy equipment for fire suppression is prohibited, unless authorized by the Field Manager.

2.7 Forestry

In accordance with the 1997 White River RMP/ROD, all trees removed in the process of construction shall be purchased from the BLM. Trees should first be used in reclamation efforts and then any excess material made available for firewood or other uses.

- a. Woody materials required for reclamation shall be removed in whole with limbs intact and shall be stockpiled along the margins of the authorized use area separate from the topsoil piles. Once the disturbance has been recontoured and reseeded, stockpiled woody material shall be scattered across the reclaimed area where the material originated. Redistribution of woody debris will not exceed 20percent ground cover. Limbed material shall be scattered across reclaimed areas in a manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. Woody material will be distributed in such a way to avoid large concentrations of heavy fuels and to effectively deter vehicle use.
- b. Trees that must be removed for construction and are not required for reclamation shall be cut down to a stump height of 6 inches or less prior to other heavy equipment operation. These trees shall be cut in four foot lengths (down to 4 inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal for company use or removal by the public.

All available topsoil will be stored for use in final reclamation. Soil storage areas will be clearly marked to restrict vehicle and equipment use. Metal fence posts, construction fencing, construction barriers or other physical barriers will be placed at regular intervals between the working surfaces and soil storage areas when necessary.

2.8 Hazardous Wastes Management

As a reasonable and prudent operator/holder acting in good faith, the operator/holder will report all emissions or releases that may pose a risk of harm to human health or the environment, regardless of a substances status as exempt or nonexempt and regardless of fault, to the BLM WRFO (970) 878-3800.

As a reasonable and prudent operator/holder, acting in good faith, the operator/holder will provide for the immediate clean-up and testing of air, water (surface and/or ground), and soils contaminated by the emission or release of any substance that may pose a risk of harm to human health or the environment, regardless of that substances status as exempt or non-exempt. Where the operator/holder fails, refuses, or neglects to provide for the immediate clean-up and testing of air, water (surface and/or ground), and soils contaminated by the emission or release of any quantity of a substance that poses a risk of harm to human health or the environment, the BLM WRFO may take measures to clean-up and test air, water (surface and/or ground), and soils at the operators/holders expense plus an additional 25 percent as per 43 CFR 3163.1 (a)(4). Such action will not relieve the operator/holder of any liability or responsibility.

Where required by law or regulation to develop a plan for the prevention of releases or the recovery of a release of any substance that poses a risk of harm to human health or the environment, provide a current copy of said plan to the BLM WRFO.

With the acceptance of this authorization, the commencement of operations under this authorization, or within thirty calendar days from the issuance of this authorization, whichever occurs first, operator/holder and, and through the operator/holder, its agents, employees, subcontractors, successors and assigns, stipulate and agree to indemnify, defend and hold harmless the United States Government, its agencies, and employees from all liability associated with the emission or release of substances that pose a risk of harm to human health or the environment.

Construction sites and all facilities shall be maintained in a sanitary condition at all times; waste materials shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

All operators/holders shall comply with all Federal, State and/or local laws, rules, and regulations, including but not limited to Onshore Orders and Notices to Lessees, addressing the emission of and/or the handling, use, and release of any substance that poses a risk of harm to human health or the environment.

When drilling to set the surface casing, drilling fluid will be composed only of fresh water, bentonite, and/or a benign lost circulation material that does not pose a risk of harm to human health or the environment (e.g., cedar bark, shredded cane stalks, mineral fiber and hair, mica flakes, ground and sized limestone or marble, wood, nut hulls, corncobs, or cotton hulls).

Through all phases of oil and gas exploration, development, and production, the operator/holder shall employ, maintain, and periodically update to the best available technology(s) aimed at reducing: (1) emissions, (2) fresh water use, and (3) utilization, production, and release of any substance that poses a risk of harm to human health or the environment.

2.9 Range Management

Any range improvement projects such as fences, water developments, cattle guards, gates, or other livestock handling/distribution facilities that are damaged or destroyed either directly or indirectly as a result of implementation of the Proposed Action shall be promptly repaired or replaced by the applicant to restore pre-disturbance functionality.

Surface disturbing activities will be coordinated with livestock grazing permittees to minimize effects of surface disturbance on approved livestock operations. This effort would include necessary consulting on scheduling of operations to mutually minimize effects.

Any damage to the function of range improvements (e.g., fence damage, cattle guard cleaning, livestock loss) from other approved operations would be repaired immediately or remedied by the operator causing the damage.

All range improvements (e.g., stock water tanks, pipelines, corrals) would be avoided by 500 feet unless no other alternative is available and impacts can be mitigated as per the BLM AO.

When industrial use dominates an allotment to the point of making it unsuitable for livestock grazing, BLM would consider granting special non-use so that livestock could be removed without penalty for a specified amount of time.

Where development is intense, operators would identify an employee to coordinate with grazing permittees on these issues.

Pipeline projects would be conducted to allow natural movement of livestock through the allotment. Gaps would be provided in the trenching process to allow livestock through the pipeline project area or project would be completed while livestock are not on the allotment.

Facilities that could be hazardous to livestock would be fenced to keep livestock out and the fences maintained in functioning condition.

Compensation would be provided by operators for cattle lost to oil and gas activities (includes deaths from pits and animals struck on roads). This would be addressed in the same manner as a road maintenance agreement, with operators making payment based on their level of activity, not on the proximity to the dead animal.

2.10 Recreation Management

During big game hunting season (generally mid-August through November) it is recommended that helicopter flights be limited to a critical, as needed basis only and no flights conducted on first two days of each big game hunting season. In <insert year>, the hunting seasons for deer, elk, pronghorn, and bear in Game Management Unit (GMU) #, are as follows: <insert dates of applicable seasons.> For information about the dates of seasons for other years, please refer to the Colorado Parks and Wildlife Big Game Hunting Brochure or contact the BLMs Outdoor Recreation Planner.

2.11 Rights-of-Way

Use areas adjoining or adjacent to previously disturbed areas for rights-of-way and utility corridors whenever possible rather than traverse undisturbed vegetation communities.

All activities shall comply with all applicable local, State, and Federal laws, statutes, regulations, standards, and implementation plans. This includes acquiring all required Federal, State, and/or local permits, effectively coordinating with existing facility right-of-way (ROW) holders, and implementing all applicable mitigation measures required by each permit.

Stabilize disturbed areas within road rights-of-way and utility corridors by implementing vegetation practices designed to hold soil in place and minimize erosion as described in the WRFO Surface Reclamation Plan (Appendix D).

Construct sediment barriers when needed to slow runoff, allow deposition of sediment, and prevent transport from the site. Employ straining or filtration mechanisms as needed for the removal of sediment from runoff.

At least 90 days prior to termination of the right-of-way, the holder shall contact the Authorized Officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan shall include, but is not limited to, removal of facilities, drainage structures, and surface material (e.g., gravel or concrete), as well as final recontouring, spreading of topsoil, and seeding. The Authorized Officer must approve the plan in writing prior to the holder's commencement of any termination activities.

Any proposal involving additional surface disturbance outside of the authorized ROW requires an application to the BLM for analysis and authorization. New stipulations for construction would be applied to projects subject to the regulations and policies existing at the time of authorization.

All terms, conditions, and stipulations of the original grant shall be carried forward and remain in full force and effect.

The holder shall conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the ROW.

The holder of the ROW grant shall not convey, assign, or otherwise transfer, in whole or in part, without prior written approval by the AO.

The holder of the ROW grant shall notify the Authorized Officer of any changes in the holder's status, such as changes in legal mailing address, financial condition, business or corporate status, and alien ownership.

For the purpose of determining joint maintenance responsibilities on shared access, the holder shall make road use plans known to all other authorized users of the common access road. Upon request, the AO shall be provided with copies of any maintenance agreement entered into.

Retention and maintenance of a permanent travel lane is not authorized in the following corridor segments: [list by milepost or legal]. On these segments, the [operator/holder] will be responsible for installing physical controls to effectively deter unauthorized vehicle use along the right-of-way, continuous maintenance of the controls (through project life), and, at a minimum, [interval] monitoring to assess the controls' efficacy. Monitoring reports and documentation of maintenance activity will be sent to the [Natural Resource Specialist/Realty Specialist] by September 30 of each year.

During pipeline construction, the ROW will remain undisturbed to the maximum extent possible. Only the minimum necessary disturbance will occur to make the working surface safe and passable. Topsoil will not be removed under areas used for the storage of soils and, if possible (i.e., not changing the grade of the working surface), topsoil will not be removed from working surfaces.

Under no circumstances will topsoil, soil material below or adjacent to the trench spoils, or subsoil excavated from the trench down to the effective rooting depth (refer to the WRFO Surface Reclamation Plan) be used as padding in the trench, to fill sacks for trench breakers, or for any other use as construction material.

2.12 Sodium Resources

Conditions of approval would be applied to permits for oil and gas drilling in areas available for sodium and multi-mineral leasing to protect sodium resources throughout the Green River Formation as follows: Utilized flooded reverse circulation drilling techniques from surface to 100 feet into the Wasatch formation to minimize fluid loss to the formation. Cement the Saline interval with Class 'G' cement plus 35percent silica flour of the surface casing with Add a fluorescent dye fluid, other than Rhodamin WT, to drilling fluids used from surface to 100 feet into the Wasatch formation. Take a drilling fluid sample every 100 feet during drilling from surface to 100 feet below the dissolution surface and analyze for pH and conductivity. Document any fluid losses during drilling, from the surface, to 100 feet into the Wasatch formation. Make available a tracer log survey of the upper most frac to demonstrate in-zone penetration and total vertical height growth achieved.

Conditions of approval would be applied to permits for oil and gas drilling on existing sodium leases to protect sodium resources throughout the Green River Formation (Appendix D): Utilized flooded reverse circulation drilling techniques from surface to 100 feet into the Wasatch formation to minimize fluid loss to the formation. Cement the Saline interval with Class ‘G’ cement plus 35percent silica flour of the surface casing with Add a fluorescent dye fluid, other than Rhodamin WT, to drilling fluids used from surface to 100 feet into the Wasatch formation. Take a drilling fluid sample every 100 feet during drilling from surface to 100 feet below the dissolution surface and analyze for pH and conductivity. Document any fluid losses during drilling, from the surface, to 100 feet into the Wasatch formation. Make available a tracer log survey of the upper most frac to demonstrate in-zone penetration and total vertical height growth achieved.

2.13 Soil and Water Resources

Soil

Disturbance across unstable or fragile soils would be allowed only after all other options have been exhausted, and the WRFO Authorized Officer has approved an engineered construction and reclamation plan for the proposed location.

Oil and gas activities in areas exhibiting accelerated soil erosion or degraded soil conditions would be allowed only after all other options have been exhausted, and the WRFO Authorized Officer has approved an engineered construction and reclamation plan for the proposed location.

Any erosion features (e.g., rilling, gullying, piping, or mass wasting) that are the result of the Proposed Action and are located either on or adjacent to the surface disturbance will be addressed immediately after observation by contacting the Natural Resource Specialist/Realty Specialist and by submitting a plan to assure successful soil stabilization with BMPs to address erosion problems

Soil storage areas will be clearly marked to restrict vehicle and equipment use. Metal fence posts, construction fencing, construction barriers or other physical barriers will be placed at regular intervals between the working surfaces and soil storage areas when necessary.

No slopes planned for revegetation will be steeper than a 3(horizontal):1(vertical) slope before topsoil is placed. After spreading topsoil and seeding, the operator/holder will spread stored woody debris, hydromulch the location, or crimp in straw to stabilize the soil surface in seeded areas.

If salt is observed on the surface of soils during reclamation activities the Natural Resource Specialist/Realty Specialist will be notified and a plan will be developed with approval of the AO to improve reclamation on the site.

Water

Any stormwater management BMPs that would result in additional surface disturbance beyond what is shown in the diagrams for the project must be submitted via Sundry Notice and approved by the AO before installation.

Surface casing shall be set to a depth below all potential sources of usable or potable drinking water. All surface casing shall be cemented from total depth back to surface. In the event surface casing cannot be set to this depth, the subsequent casing string shall be cemented from its total depth to at least 100 feet above the surface casing shoe. In the event surface casing cementing does not reach the surface, that casing shall be remedially cemented by squeeze or top cementing as approved by the BLM FO.

Operators would construct reserve pits with 2 feet of freeboard in cut areas or in compacted and stabilized fill. Reserve pits would not be located in areas in which groundwater is less than 50 feet from the surface. A closed system would be required if water shows in the conductor hole.

To ensure the timely review of the water quality data, the operator is required to have a CDPHE approved firm contracted to conduct water samples and to send a copy of water quality test results to the BLM WRFO at the same time that they are sent to the operator.

Pursuant to Onshore Order Number 7, a permanent disposal method for produced water must be approved by BLM and in operation 90-days after well completion. The reserve pit may not be used for produced water disposal after these 90-days except with prior written permission of the BLM AO.

2.14 Special Status Species – Plants

Prior to approving surface-disturbing or potentially impacting activities within known (occupied), suitable, or potential habitat for federal listed, proposed, and candidate species, a plant inventory conducted by a qualified botanist and an environmental analysis would be required for the Proposed Action. Based on the results of the plant survey, Section 7 consultation with FWS may be necessary, and appropriate conservation measures may be required to avoid or minimize impacts on federally listed species.

Limit motorized vehicle travel within and outside ACECs used to support oil and gas exploration and development activities within occupied, suitable, or potential habitats for federally listed species, proposed species, candidate species and BLM sensitive species to existing routes. Roads or trails in these areas not designated for use will be abandoned and reclaimed. Off road motorized vehicle travel will be prohibited in these areas.

Limit motorized vehicle travel for oil and gas activities within at least 660 feet of occupied, suitable, or potential habitats for federally listed, proposed, and candidate species to existing routes. Limit motorized vehicle travel for oil and gas activities within 330 feet of occupied BLM sensitive species habitat to existing routes.

Limit maintenance of existing and planned roads and/or rights or ways within special status plant species occupied, suitable or potential habitats to the existing disturbance; maintenance would be performed in accordance with specifications provided by the BLM during site specific environmental analysis.

All occupied habitat of federally listed plants would be exclusion areas for new ROW authorizations. All suitable and potential habitat for listed and candidate plants would be avoidance areas for new ROW authorizations.

Conditions of approval identified as appropriate through environmental analysis to mitigate the impacts to federally listed, proposed, and candidate species would be applied to land use authorizations, permits, and leases that fall within the plant consideration area of the affected plant species. Possible mitigation strategies may include, but are not limited to:

- a. Adjusting the location of the disturbance outside of the plant consideration area;
- b. The use of several dust abatement measures;
- c. Using signs, fencing, and other deterrents to reduce possible human disturbance;
- d. Requiring construction to occur outside of the blooming season (September through March);
- e. Using a higher percentage of forbs in the reclamation seed mix to promote pollinator habitat; and
- f. Using a qualified, independent third party contractor to provide general oversight.

Control of 80 percent of fugitive dust within 330 feet from edge of occupied, suitable, and/or potential special status plant species (federally listed species, proposed species and candidate species) habitat would be achieved using BLM approved dust suppression methods to be determined on a case by case basis.

If plants of concern are known from the vicinity of potential project areas or potential habitat is present, plan to conduct field surveys for the plants of concern. Field botanical surveys should be conducted at a time when the plant species of concern can be detected and accurately identified. In some cases multi-year surveys are necessary. For example, in dry years some ephemeral annuals may not germinate and produce plants, but they are still present at the site in the seed bank. Botanical surveys are generally considered valid for three years.

Field botanical surveys should be completed within a 1,980 feet survey area around the project disturbance area. In some cases the topographic setting or land ownership patterns may impede covering the full recommended survey area. Surveys should also include areas where direct or indirect effects may impact hydrology. Surveys should be floristic, providing a list of plant species encountered during the survey. Negative survey data should also be reported.

Where avoidance is not feasible and development is allowed within 660 feet of plant populations, impacts to the plants of concern can be reduced by placing temporary fencing or other barriers around the footprint of the project so that vehicles don't go any further than needed and the sensitive habitat is avoided as much as possible. To avoid working in rare plant habitat and drawing attention to the plants, the edge of disturbance should be fenced, not the nearby plant population. Communication of the importance of rare plant habitat protection with those working on the project is vital to the success of fencing or barriers.

Ex-situ techniques such as transplanting are not recommended under any circumstances.

Construction should take place down slope of plants of concern where feasible. Down slope ground disturbing activities should be conducted in such a way as to avoid as much as is reasonably possible undercutting and sloughing of the slopes where rare plant habitat occurs. If well pads and roads must be sited upslope, buffers of 660 ft minimum between surface disturbances and plants of concern should be incorporated.

Ensure that a botanical expert is on site when clearing of vegetation occurs in the vicinity of plant species of concern.

Perform frequent and timely inspections of development sites and plants of concern occurrences to ensure that BMPs are being followed, and to identify areas of potential conflict. Inspections of plant occurrences should be performed by a botanist or other qualified personnel.

Replace soil and sub-soil horizons in their pre-disturbance order. Reclamation of the soil layers may allow future establishment of special status plant species on potential habitat

Restrict motorized travel to designated roads and trails. Routes should be designated and marked prior to implementation.

Prevent plumes of dust and particulate matter from impacting plants of concern. While new roads should not be built within 600 feet of the plants of concern, preexisting roads with an expected increase in traffic should be graveled in these areas. The operator is encouraged to apply water for dust abatement to such areas during the flowering period. If possible, dust abatement applications should be comprised of water only, with minimal use of magnesium chloride.

The operator will appoint a qualified, Independent Third-Party Contractor (Contractor) to provide general project oversight, assure compliance with the terms and conditions of the approval, and perform monitoring. The Contractor will be present during all surface disturbing operations that occur until reclamation is completed. Prior to the initiation of construction, pre-work meetings will be held between the BLM, the operator, and the Contractor to discuss required procedures associated with the conditions of approval.

All vegetation within the ACEC portion of the ROW corridor, with the exception of that immediately above the pipeline trench, shall be brush-hogged and left in place. The maximum allowable disturbance in the ACEC is brush hogging the ROW.

In the event that the operator elects to employ a padding machine to lay pipe within that portion of the ROW corridor that is also within the ACEC, said padding machine will include the use of necessary apparatus to prevent the generation of fugitive dust.

Any contractor or agent hauling earthen material, in association with the Proposed Action, will cover all of their loads.

2.15 Vegetation and Invasive species

General

All disturbed areas shall be promptly seeded with Native or Standard Seed Mix <insert seed mix number> (see below). The elevation and vegetation community for this location are: Mid Elevation Sagebrush (5,500-7,200 ft). Therefore it is recommended that this site be seeded in accordance with the WRFO Surface Reclamation Plan (Appendix D). If an alternate date of seeding is requested, contact the designated Natural Resource Specialist/Realty Specialist prior to seeding for approval. Seed mixture rates are Pure Live Seed (PLS) pounds per acre. Drill seeding is the preferred method of application and drill seeding depth shall be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding, and harrowed into the soil.

Use seed that is certified and free of noxious weeds. All seed tags will be submitted via Sundry Notice (SN)/<letter for Realty> to the designated Natural Resource Specialist/Realty Specialist within 14 calendar days from the time the seeding activities have ended. The SN will include the purpose of the seeding activity (i.e., seeding well pad cut and fill slopes, seeding pipeline corridor). In addition, the SN will include the well or well pad number associated with the seeding activity, if applicable, the name of the contractor that performed the work, his or her phone number, the method used to apply the seed (e.g., broadcast, hydro-seeded, drilled), whether the seeding activity represents interim or final reclamation, an estimate of the total acres seeded, an attached map that clearly identifies all disturbed areas that were seeded, and the date the seed was applied.

The operator/holder will be required to meet with the WRFO reclamation staff in March or April of each calendar year and present a comprehensive work plan. The purpose of the plan is to provide information pertaining to reclamation activities that are expected to occur during the current growing season. Operators/holders shall also provide a map that shows all reclamation sites where some form of reclamation activity is expected to occur during the current growing season.

A Reclamation Status Report will be submitted to the WRFO annually according to the WRFO Surface Reclamation Plan (Appendix D) for all actions that require disturbance of surface soils on BLM administered lands as a result of the Proposed Action. The Reclamation Status Report will include the well number, API number, legal description, UTM coordinates, project description (e.g., well pad, pipeline), reclamation status (e.g., interim or final), whether the well pad or pipeline has been revegetated and/or re-contoured, date seeded, photos of the reclaimed site, estimate of acres seeded, seeding method (e.g., broadcast, drilled, hydro-seeded), and contact information for the person responsible for developing the report. The report will include maps showing each point (i.e., well pad), polygon, or polyline (i.e., pipeline) feature that was included in the report. The data must be submitted in UTM Zone 13N, NAD 83, in units of meters. In addition, scanned copies of seed tags that accompanied the seed bags will be included with the report. Internal and external review of the WRFO Reclamation Status Report and the process used to acquire the necessary information will be conducted annually, and new information or changes in the reporting process will be incorporated into the report. The Reclamation Status Report will be submitted to the BLM Reclamation Coordinator.

A reclamation status report for each site would be submitted electronically to the WRFO annually until it is determined that reclamation of the site has met all required objectives of the particular reclamation phase. Every third year, a vegetation monitoring report should accompany the status report. (See Appendix D, Section 4.2 for the minimum components to be included in the report.)

Consult the BLM Integrated Vegetation Management Handbook to reach BLM objectives of maintaining and restoring native plant community diversity, resiliency, and productivity (BLM 2008). This handbook addresses renewable resource management and provides BMPs that can be used for energy development related projects.

Riparian and Remnant Vegetation Associations

Authorized surface-disturbing activities and/or facilities that are negatively affecting riparian or wetland habitat would be required to immediately undertake mitigation and, if impacts are not mitigated, then relocate activities/facilities outside riparian/wetland habitat.

Reclamation of surface disturbance resulting from authorized activities within RVAs would use only locally gathered or genetic stock from locally gathered native species.

Locally collected seed or genetic stock from locally gathered seed would be used for reclamation and available in adequate quantity for reclamation needs prior to issuance of the notice to proceed. If such seed is not available in adequate quantity, then collection from the site of disturbance would be required. All seed collection, storage, or increase would be conducted in accordance with approved collection, storage, and seed increase protocols. If three growing seasons pass without adequate collection to provide the quantity necessary for reclamation needs, the impact of using non-local native species on the genetic integrity of native species would be evaluated by BLM and mitigated through site-specific environmental analysis.

Noxious and Invasive Weeds

A pre-disturbance weed survey shall identify and quantify noxious and/or invasive weeds within the areas of direct and indirect use (i.e., within 660 feet of direct use), including all access roads, pipelines, and other associated surface disturbance. The weed survey report shall be submitted to the designated Natural Resource Specialist/Realty Specialist prior to initiating surface disturbing activities.

All authorized users of disturbed areas including rights-of ways would be required to inventory the entire project area for noxious weeds and invasive species in both the spring and fall through final abandonment. Results of surveys would be provided to BLM as described in the WRFO Surface Reclamation Plan (Appendix D).

On BLM lands, noxious weeds on the Colorado Department of Agriculture's State Weed List A would be eliminated; noxious weeds on the Colorado Department of Agriculture's State Weed B and C Lists would be controlled; and the spread of invasive species within the permitted area of direct and indirect use (as defined in Appendix D) would be controlled and prevented. The following COAs would be attached to land use authorizations:

- All equipment that may act as a vector for weeds shall be washed before entering the WRFO. Equipment would also be washed when leaving and/or moving between work-sites if the pre-disturbance weed inventory indicated the presence of undesirable invasive or noxious weeds and there is a risk of transporting weed seeds or root propagules.
- Certified weed-free mulches, as per state guidelines, would be used (BLM 2006f).
- All seed applied on BLM public lands would comply with BLM policy described in IM 2006-073 (BLM 2006f).
- All authorized users of disturbed areas including rights-of ways would be required to inventory the entire project area for noxious weeds and invasive species in both the spring and fall through final abandonment. Results of surveys would be provided to BLM as described in Appendix D.
- Operators would prepare and implement weed management plans for projects consistent with the WRFO Surface Reclamation Plan (see Appendix D).
- Operators would be responsible for ensuring all products placed on public lands (e.g., materials from gravel pits/quarries) are free of noxious weeds, including seeds or root material, listed on Colorado Department of Agriculture's State Weed List for A and B listed species. All sites shall be monitored and treated for noxious weeds, on an annual basis, for the life of the project until Final Abandonment has been approved by the BLM. Monitoring of land-disturbing activities will use permanent photo points to identify noxious weed growth stages, degree of infestation, and trends.

All pest control proposals will include an environmental analysis developed within an Integrated Pest Management format.

Sterile hybrids or sterile cereal annual grasses would not generally be approved for use on public lands for reclamation efforts.

Herbicide Application

Application of herbicides shall comply with the WRFO Integrated Weed Management Plan.

Pesticide Use Proposals (PUPs) shall be submitted to and approved by the BLM before applying herbicides on BLM lands. The PUP will include target weed species, the herbicides to be used, application rates and timeframes, estimated acres to be treated, as well as maps depicting the areas to be treated and known locations of weeds.

Application of herbicides must be under field supervision of an EPA-certified pesticide applicator. Herbicides must be registered by the EPA and application proposals must be approved by the BLM.

Use of off-highway vehicles (OHVs) for access to weed treatment areas along the pipeline/power line ROW will be considered on a case-by-case basis, provided that access is limited and will not create visible tracks, and will require prior written approval from the AO.

2.16 Visual Resource Management

All above ground facilities shall be painted to blend in with the surrounding environment. The chosen paint color will be selected from the BLM Standard Environmental Color Chart in consultation with the BLM Visual Resource Specialist.

2.17 Wild Horse Management

Should the Proposed Action occur simultaneously with a wild horse gather, all project-related traffic, including helicopters, would need to be coordinated with the BLM and the gather contractor.

To minimize incidents where young foals become separated from their mares, helicopters should avoid flights over wild horses observed in the area. Drilling and receiving crews are required to slow down or stop when wild horses are encountered, allowing bands to move away at a pace slow enough so that foals can keep pace and are not separated.

A “horseproof” cattle guard shall be installed and maintained at the following locations: [describe location or give legal description]. To reduce the potential for injuries to wild horses, sucker rod or rebar should be tack welded (centered between the equally spaced rails) to each cross member for the entire length and width of the cattle guard. “Horseproof” cattle guards shall be painted a dark color to help with snow melt.

In wild horse use areas, open trenches for burial of gathering pipelines should be inspected daily to reduce the potential for horses to become trapped should they fall into a trench. If a horse has fallen into the trench the BLM Range Staff shall be notified immediately.

No motorized or surface-disturbing activities within a 2,000-foot radius around water sources in the Piceance-East Douglas Herd Management Area.

2.18 Wildlife Management

The operator shall prevent migratory bird access to facilities that store or are expected to store fluids which may pose a risk to such birds (e.g., toxicity, compromised insulation). Features that prevent access to such fluids must be in place and functional within 24 hours of the drilling rig moving off the location and shall remain effective until such pits are removed or incapable of storing fluids. Deterrence methods may include netting or other alternative methods that effectively prevent use and that meet BLM approval (the use of “bird balls” is discouraged). It will be the responsibility of the operator to notify the BLM of the method that will be used to prevent use two weeks prior to when completion activities are expected to begin. The BLM approved method will be applied within 24 hours after completion activities have begun. All lethal and non-lethal events that involve migratory birds will be reported to the BLM AO immediately.

Surface disturbance and vegetation clearing associated with project construction should generally be located to avoid vegetative types in most limited supply, those less conducive to successful reclamation, or those representing greater site-specific value for wildlife, as determined during the NEPA process. Examples of these vegetative types are juniper stands in a predominant sagebrush type, sagebrush in a predominant woodland type, mature tree stands rather than younger growth, and woodlands with well-developed understory rather than with barren understory.

Vehicular access by the public on important wildlife habitats and/or during sensitive functional use periods (e.g., big game severe winter range, critical summer use areas, raptor nesting areas, sage grouse reproductive habitats) would be subject to restrictions as directed by the Area Manager. Use of restricted road segments by authorized personnel (e.g., BLM personnel, law enforcement, permitted land users) may be allowed for administrative and operational purposes. Methods used to restrict vehicular access may include: installing lockable gates, barricades or other forms of deterrents, signing, or reclaiming and abandoning roads or trails no longer necessary for management, or other methods prescribed by the Field Manager.

Woodland treatments will be designed and located where possible to replicate natural patterns of forest succession and distribution. Efforts will be made to minimize community fragmentation, including structural and we class components. In general, no point within an opened stand will be more than 200 yards from equal or greater intervals of cover.

Power lines shall be constructed in accordance with most current avian protection standards, for example, those designs presented in "Suggested Practices for Avian Protection on Power Lines, The State of the Art in 2006", Avian Power Line Interaction Committee, Edison Electric Institute and California Energy Commission (2006) (www.aplic.org). The holder shall assume the burden and expense of proving that pole designs deviating from those shown in the above publication provide effective electrocution and line-strike protection for birds. Such proof shall be provided by a subject-matter expert approved by the AO. The BLM reserves the right to require modifications or additions to all power line structures placed on this ROW, should they be necessary to ensure the safety of large birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Encourage oil and gas operators to develop Avian Protection Plans that are similar to those voluntary partnerships formed between the utility industry and FWS to identify and implement practices that reduce the risk of bird mortality and the operators' liability under the Migratory Bird Treaty Act.

A raptor nest survey will be required in habitats potentially influenced by the Proposed Action, including suitable woodland habitat within [990] feet of project-related disturbance, and suitable cliff/rock outcrops within [1,320] feet of project-related disturbance. Surveys must be consistent with the most current WRFO raptor survey protocol (available upon request) and survey results must be analyzed by WRFO prior to project initiation. Depending on specific project circumstances and nest status, nest sites documented through these surveys would be subject to siting constraints and timing limitations.

In areas of concentrated development (e.g., the geography encompassing acute/collective activity), vehicle use on BLM vehicle access networks (including existing roads, trails, and ways), where logistically practicable, would be temporarily limited to that associated directly with oil and gas development, production, and maintenance. Use by other BLM permittees could be considered, as determined by the Authorized Officer, consistent with big game management objectives. To be effective, this mitigation should control the use of vehicle access networks in areas of concentrated development rather than controls applied to individual well access roads.

Road abandonment and use limitations would be used to limit effective road densities in the long term to an average maximum 1.5 miles per square mile in higher value big game habitat (i.e., defined severe winter range, severe winter range/winter concentration areas and summer ranges) and 3 miles per square mile on other big game ranges.

The design of utility corridors would be required to avoid the need for regular vehicular access for inspection by the ROW grantee/lessee and would be conditioned by the grantee/lessee to effectively preclude all subsequent vehicular travel throughout the term of the grant/lease. In the event continued access is required, the corridor would remain closed to public vehicular access and the grant/lease holder would be responsible for installing and maintaining effective vehicle deterrents that would be functional beyond final abandonment of the grant/lease.

In areas under an existing lease, a program would be developed in cooperation with current leaseholders, to apply (where appropriate) the most current reclamation standards and practices to existing well pads, roads, and pipelines. These standards and practices would be applied in annual increments that would allow for completed interim or final reclamation of active and inactive ROW corridors and producing, plugged, and abandoned wells and access roads within 20 years. This action would be most relevant to the Douglas/Evacuation Creek, Coal Oil Basin, Indian Valley, Crooked Wash, and White River Dome areas.

On a case-by-case basis and in addition to standard interim and final reclamation measures, special reclamation components or techniques would be prescribed to restore or provide supplemental forage species that would aid in meeting big game objectives (e.g., deciduous browse). While these additional forage species could be non-native species, species used could not be invasive or prone to persist in the community for more than a decade (e.g., non-native leguminous forbs).

Well access roads would be unavailable for public vehicular access (e.g., public access not expressly associated with natural gas facility development and maintenance), including BLM permittees not expressly associated with oil and gas development, production, monitoring, and maintenance. Exceptions would be evaluated on a case-by-case basis in the context of disturbance thresholds established for each seasonal range and leaseholding.

Access developed for well and facility access would generally be subject to complete abandonment once its intended use is complete.

Within occupied range of greater sage-grouse, operational noise from pump jacks and compressors should not exceed 49 dB at 30 feet from the source.

Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.

Restrict the construction of tall facilities, distribution powerlines, and fences to the minimum number and amount needed.

Design or site permanent structures to minimize impacts to sage-grouse, with emphasis on locating and operating facilities that create movement (e.g., pump jacks) or attract frequent human use and vehicular traffic (e.g., fluid storage tanks), in a manner to minimize disturbance of sage-grouse or interference with habitat use.